

Interactive comment on “The characteristics of gravelly soil physical properties and their effects on permafrost dynamics: A case study on the central Qinghai-Tibetan Plateau” by Shuhua Yi et al.

Anonymous Referee #1

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High gravel content is a well-known phenomenon in the Tibetan Plateau, but it is hard to quantify its impacts on land surface processes, particularly to soil freezing/thawing, because of high cost in time and labor of conducting laboratory experiment in frozen condition. This study first conducted time-consuming laboratory experiments in both unfrozen and frozen conditions, and then tested the importance of the measured parameters through sensitivity modeling analysis. I also read an early version of this study published in TCD three year ago that did not present experimental results. I believe the current study is a great contribution to deepening our understanding to the

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land processes in the Tibetan Plateau. As far as I know, this is the first study that quantifies the impact of typical gravelly soils on land permafrost processes. I would like to congratulate the authors for their success and contribution.

I only have two minor comments:

(1) I notice that the authors did not take into account soil organic matters (SOC) in the simulation. SOC is another important factor to affect land surface processes, including soil freezing/thawing processes. It will be beneficial to readers if you can discuss the overall effects of gravels and SOC on the PBL, ADL, and soil moisture. Are their effects additive or do their effects cancel out each other? By the way, I did not find information of SOC content for this site.

(2) The authors should pay attention to the readability of the tables and figures, For example; I cannot understand the numbers in Table 5. Also, it is hard to understand the slope0, slope 5, slope10 in Figure 7, if not referring to the text. The tables and figures should be self-contained.

Interactive comment on The Cryosphere Discuss., https://doi.org/10.5194/tc-2018-11, 2018.

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